



## SEQUENCE LISTING

<110> ARCANGEL, Phillip  
CHIEN, David Y.

<120> HCV ASSAY

<130> 2300-19199

<150> 60/409,515

<151> 2002-09-09

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<170> PatentIn version 3.2

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<211> 2058

<212> DNA

<213> Artificial

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<223> NS3/41 conformational epitope DNA sequence

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Cys Ile Ile Thr Ser Leu Thr Gly Arg Asp Lys Asn Gln Val Glu Gly  
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Glu Val Gln Ile Val Ser Thr Ala Ala Gln Thr Phe Leu Ala Thr Cys  
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Ile Ala Ser Pro Lys Gly Pro Val Ile Gln Met Tyr Thr Asn Val Asp  
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Pro Cys Thr Cys Gly Ser Ser Asp Leu Tyr Leu Val Thr Arg His Ala  
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Lys Phe Leu Ala Asp Gly Gly Cys Ser Gly Ala Tyr Asp Ile Ile	
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 Pro Asp Tyr Asn Pro Pro Leu Val Glu Thr Trp Lys Lys Pro Asp Tyr  
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 Trp Lys Lys Pro Asp Tyr Glu Pro Pro Val Val His Gly Arg Lys Thr  
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Trp Gly Ser Ile Lys Gly Leu Thr Glu Gly Leu His Gly Phe His Val  
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His Val Gly Asp Leu Gly Asn Val Thr Ala Asp Lys Asp Gly Val Ala  
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Asp Val Ser Ile Glu Asp Ser Val Ile Ser Leu Ser Gly Asp His Cys  
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220																																																																																																																			
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Gln Asn Ile Gln Leu Ile Val Asp Phe Ile Pro Val Glu Asn Leu Glu																																																																																																																			
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Arg Thr Ile Thr Thr Gly Ser Pro Ile Thr Tyr Ser Thr Tyr Gly Lys																																																																																																																			
325	330	335		ttc ctt gcc gac ggc ggg tgc tcg ggg ggc gct tat gac ata ata att	1056	Phe Leu Ala Asp Gly Gly Cys Ser Gly Gly Ala Tyr Asp Ile Ile Ile		340	345	350		tgt gac gag tgc cac tcc acg gat gcc aca tcc atc ttg ggc att ggc	1104	Cys Asp Glu Cys His Ser Thr Asp Ala Thr Ser Ile Leu Gly Ile Gly		355	360	365		act gtc ctt gac caa gca gag act gcg ggg ggc aga ctg gtt gtg ctc	1152	Thr Val Leu Asp Gln Ala Glu Thr Ala Gly Ala Arg Leu Val Val Leu		370	375	380		gcc acc gcc acc cct ccg ggc tcc gtc act gtg ccc cat ccc aac atc	1200	Ala Thr Ala Thr Pro Pro Gly Ser Val Thr Val Pro His Pro Asn Ile		385	390	395	400	gag gag gtt gct ctc acc acc gga gag act ggc aag ctc ttt tac ggc aag	1248	Glu Glu Val Ala Leu Ser Thr Thr Gly Glu Ile Pro Phe Tyr Gly Lys		405	410	415		gct atc ccc ctc gaa gta atc aag ggg ggg aga cat ctc atc ttc tgt	1296	Ala Ile Pro Leu Glu Val Ile Lys Gly Gly Arg His Leu Ile Phe Cys		420	425	430		cat tca aag aag aag tgc gac gaa ctc gcc gca aag ctg gtc gca ttg	1344	His Ser Lys Lys Cys Asp Glu Leu Ala Ala Lys Leu Val Ala Leu		435	440	445																																																									
335																																																																																																																			
ttc ctt gcc gac ggc ggg tgc tcg ggg ggc gct tat gac ata ata att	1056																																																																																																																		
Phe Leu Ala Asp Gly Gly Cys Ser Gly Gly Ala Tyr Asp Ile Ile Ile																																																																																																																			
340	345	350		tgt gac gag tgc cac tcc acg gat gcc aca tcc atc ttg ggc att ggc	1104	Cys Asp Glu Cys His Ser Thr Asp Ala Thr Ser Ile Leu Gly Ile Gly		355	360	365		act gtc ctt gac caa gca gag act gcg ggg ggc aga ctg gtt gtg ctc	1152	Thr Val Leu Asp Gln Ala Glu Thr Ala Gly Ala Arg Leu Val Val Leu		370	375	380		gcc acc gcc acc cct ccg ggc tcc gtc act gtg ccc cat ccc aac atc	1200	Ala Thr Ala Thr Pro Pro Gly Ser Val Thr Val Pro His Pro Asn Ile		385	390	395	400	gag gag gtt gct ctc acc acc gga gag act ggc aag ctc ttt tac ggc aag	1248	Glu Glu Val Ala Leu Ser Thr Thr Gly Glu Ile Pro Phe Tyr Gly Lys		405	410	415		gct atc ccc ctc gaa gta atc aag ggg ggg aga cat ctc atc ttc tgt	1296	Ala Ile Pro Leu Glu Val Ile Lys Gly Gly Arg His Leu Ile Phe Cys		420	425	430		cat tca aag aag aag tgc gac gaa ctc gcc gca aag ctg gtc gca ttg	1344	His Ser Lys Lys Cys Asp Glu Leu Ala Ala Lys Leu Val Ala Leu		435	440	445																																																																	
350																																																																																																																			
tgt gac gag tgc cac tcc acg gat gcc aca tcc atc ttg ggc att ggc	1104																																																																																																																		
Cys Asp Glu Cys His Ser Thr Asp Ala Thr Ser Ile Leu Gly Ile Gly																																																																																																																			
355	360	365		act gtc ctt gac caa gca gag act gcg ggg ggc aga ctg gtt gtg ctc	1152	Thr Val Leu Asp Gln Ala Glu Thr Ala Gly Ala Arg Leu Val Val Leu		370	375	380		gcc acc gcc acc cct ccg ggc tcc gtc act gtg ccc cat ccc aac atc	1200	Ala Thr Ala Thr Pro Pro Gly Ser Val Thr Val Pro His Pro Asn Ile		385	390	395	400	gag gag gtt gct ctc acc acc gga gag act ggc aag ctc ttt tac ggc aag	1248	Glu Glu Val Ala Leu Ser Thr Thr Gly Glu Ile Pro Phe Tyr Gly Lys		405	410	415		gct atc ccc ctc gaa gta atc aag ggg ggg aga cat ctc atc ttc tgt	1296	Ala Ile Pro Leu Glu Val Ile Lys Gly Gly Arg His Leu Ile Phe Cys		420	425	430		cat tca aag aag aag tgc gac gaa ctc gcc gca aag ctg gtc gca ttg	1344	His Ser Lys Lys Cys Asp Glu Leu Ala Ala Lys Leu Val Ala Leu		435	440	445																																																																									
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act gtc ctt gac caa gca gag act gcg ggg ggc aga ctg gtt gtg ctc	1152																																																																																																																		
Thr Val Leu Asp Gln Ala Glu Thr Ala Gly Ala Arg Leu Val Val Leu																																																																																																																			
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gcc acc gcc acc cct ccg ggc tcc gtc act gtg ccc cat ccc aac atc	1200																																																																																																																		
Ala Thr Ala Thr Pro Pro Gly Ser Val Thr Val Pro His Pro Asn Ile																																																																																																																			
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gag gag gtt gct ctc acc acc gga gag act ggc aag ctc ttt tac ggc aag	1248																																																																																																																		
Glu Glu Val Ala Leu Ser Thr Thr Gly Glu Ile Pro Phe Tyr Gly Lys																																																																																																																			
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His Ser Lys Lys Cys Asp Glu Leu Ala Ala Lys Leu Val Ala Leu																																																																																																																			
435	440	445																																																																																																																	
445																																																																																																																			

ggc atc aat gcc gtc gcc tac tac cgc ggt ctt gac gtc tcc gtc atc Gly Ile Asn Ala Val Ala Tyr Tyr Arg Gly Leu Asp Val Ser Val Ile 450 455 460	1392
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ggc tat acc ggc gac ttc gac tcg gtc ata gac tgc aat acg tgt gtc Gly Tyr Thr Gly Asp Phe Asp Ser Val Ile Asp Cys Asn Thr Cys Val 485 490 495	1488
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cac ttt cta tcc cag aca aag gag agt ggg gag aac ctt cct tac ctg His Phe Leu Ser Gln Thr Lys Gln Ser Gly Glu Asn Leu Pro Tyr Leu 610 615 620	1872
gta gcg tac caa gcc acc gtg tgc gct agg gct caa gcc cct ccc cca Val Ala Tyr Gln Ala Thr Val Cys Ala Arg Ala Gln Ala Pro Pro Pro 625 630 635 640	1920
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cat ggg cca aca ccc ctg cta tac aga ctg ggc gct gtt cag aat gaa His Gly Pro Thr Pro Leu Leu Tyr Arg Leu Gly Ala Val Gln Asn Glu 660 665 670	2016
atc acc ctg acg cac cca gtc acc aaa tac atc atg aca tgc atg tgc Ile Thr Leu Thr His Pro Val Thr Lys Tyr Ile Met Thr Cys Met Ser 675 680 685	2064

gcc gac ctg gag gtc gtc acg acg gca tgc tcc ggg aag ccg gca atc Ala Asp Leu Glu Val Val Thr Ser Ala Cys Ser Gly Lys Pro Ala Ile 690 695 700	2112
ata cct gac agg gaa gtc ctc tac cga gag ttc gat gag atg gaa gag Ile Pro Asp Arg Glu Val Leu Tyr Arg Glu Phe Asp Glu Met Glu Glu 705 710 715 720	2160
tgc tct cag cac tta ccg tac atc gag caa ggg atg atg ctc gcc gag Cys Ser Gln His Leu Pro Tyr Ile Glu Gln Gly Met Met Leu Ala Glu 725 730 735	2208
cag ttc aag cag aac gcc ctc ggc ctc tcg cga ggg ggc aag ccg gca Gln Phe Lys Gln Lys Ala Leu Gly Leu Ser Arg Gly Gly Lys Pro Ala 740 745 750	2256
atc gtt cca gac aaa gag gtg ttg tat caa caa tac gat gag atg gaa Ile Val Pro Asp Lys Glu Val Leu Tyr Gln Gln Tyr Asp Glu Met Glu 755 760 765	2304
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ata gcc ttc gcc tcc aga ggg aac cat gtt tcc ccc acg cac tac gtt Ile Ala Phe Ala Ser Arg Gly Asn His Val Ser Pro Thr His Tyr Val 865 870 875 880	2640
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gaa cca cct gtg gtc cac ggc aga tct tct cgg aga ttc gcc cag gcc Glu Pro Pro Val Val His Gly Arg Ser Ser Arg Arg Phe Ala Gln Ala 915 920 925	2784

ctg ccc gtt tgg gcg cgg ccg gac tat aac ccc ccc cta gtg gag acg	2832		
Leu Pro Val Trp Ala Arg Pro Asp Tyr Asn Pro Pro Leu Val Glu Thr			
930	935	940	
tgg aaa aag ccc gac tac gaa cca cct gtg gtc cat ggc aga aag acc	2880		
Trp Lys Lys Pro Asp Tyr Glu Pro Pro Val Val His Gly Arg Lys Thr			
945	950	955	960
aaa cgt aac acc aac cgg cgg ccg cag gac gtc aag ttc ccg ggt ggc	2928		
Lys Arg Asn Thr Asn Arg Arg Pro Gln Asp Val Lys Phe Pro Gly Gly			
965	970	975	
ggc atc gtt ggt cgc agg ggc cct cct atc ccc aag gct cgt cgg	2976		
Gly Gln Ile Val Gly Arg Arg Gly Pro Pro Ile Pro Lys Ala Arg Arg			
980	985	990	
ccc gag ggc agg acc tgg gct cag ccc ggt tac cct tgg ccc ctc tat	3024		
Pro Glu Gly Arg Thr Trp Ala Gln Pro Gly Tyr Pro Trp Pro Leu Tyr			
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ggc aat aag gac aga cgg tct aca ggt aag tcc tgg ggt aag cca ggg	3072		
Gly Asn Lys Asp Arg Arg Ser Thr Gly Lys Ser Trp Gly Lys Pro Gly			
1010	1015	1020	
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Tyr Pro Trp Pro Arg Lys Thr Lys Arg Asn Thr Asn Arg Arg Pro Gln			
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gac gtc aag ttc ccg ggt ggc ggt cag atc gtt ggt cgc agg ggc cct	3168		
Asp Val Lys Phe Pro Gly Gly Gln Ile Val Gly Arg Arg Gly Pro			
1045	1050	1055	
cct atc ccc aag gct cgt cgg ccc gag ggc agg acc tgg gct cag ccc	3216		
Pro Ile Pro Lys Ala Arg Arg Pro Glu Gly Arg Thr Trp Ala Gln Pro			
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ggc tac cct tgg ccc ctc tat ggc aat aag gac aga cgg tct acc ggt	3264		
Gly Tyr Pro Trp Pro Leu Tyr Gly Asn Lys Asp Arg Arg Ser Thr Gly			
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Lys Ser Trp Gly Lys Pro Gly Tyr Pro Trp Pro			
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Gly Ile Ile Asn Phe Glu Gln Lys Glu Ser Asn Gly Pro Val Lys Val			
20	25	30	

Trp	Gly	Ser	Ile	Lys	Gly	Leu	Thr	Glu	Gly	Leu	His	Gly	Phe	His	Val
35						40					45				
His	Glu	Phe	Gly	Asp	Asn	Thr	Ala	Gly	Cys	Thr	Ser	Ala	Gly	Pro	His
50						55				60					
Phe	Asn	Pro	Leu	Ser	Arg	Lys	His	Gly	Gly	Pro	Lys	Asp	Glu	Glu	Arg
65						70				75					80
His	Val	Gly	Asp	Leu	Gly	Asn	Val	Thr	Ala	Asp	Lys	Asp	Gly	Val	Ala
85							90				95				
Asp	Val	Ser	Ile	Glu	Asp	Ser	Val	Ile	Ser	Leu	Ser	Gly	Asp	His	Cys
100							105				110				
Ile	Ile	Gly	Arg	Thr	Leu	Val	Val	His	Glu	Lys	Ala	Asp	Asp	Leu	Gly
115							120				125				
Lys	Gly	Gly	Asn	Glu	Glu	Ser	Thr	Lys	Thr	Gly	Asn	Ala	Gly	Ser	Arg
130							135				140				
Leu	Ala	Cys	Gly	Val	Ile	Gly	Ile	Ala	Gln	Asn	Leu	Asn	Ser	Gly	Cys
145							150				155				160
Asn	Cys	Ser	Ile	Tyr	Pro	Gly	His	Ile	Thr	Gly	His	Arg	Met	Ala	Trp
165								170				175			
Lys	Leu	Gly	Ser	Ala	Ala	Arg	Thr	Thr	Ser	Gly	Phe	Val	Ser	Leu	Phe
180							185					190			
Ala	Pro	Gly	Ala	Lys	Gln	Asn	Glu	Thr	His	Val	Thr	Gly	Gly	Ala	Ala
195							200				205				
Ala	Arg	Thr	Thr	Ser	Gly	Leu	Thr	Ser	Leu	Phe	Ser	Pro	Gly	Ala	Ser
210							215				220				
Gln	Asn	Ile	Gln	Leu	Ile	Val	Asp	Phe	Ile	Pro	Val	Glu	Asn	Leu	Glu
225							230				235				240
Thr	Thr	Met	Arg	Ser	Pro	Val	Phe	Thr	Asp	Asn	Ser	Ser	Pro	Pro	Val
245								250				255			
Val	Pro	Gln	Ser	Phe	Gln	Val	Ala	His	Leu	His	Ala	Pro	Thr	Gly	Ser
260								265				270			
Gly	Lys	Ser	Thr	Lys	Val	Pro	Ala	Ala	Tyr	Ala	Ala	Gln	Gly	Tyr	Lys
275								280				285			
Val	Leu	Val	Leu	Asn	Pro	Ser	Val	Ala	Ala	Thr	Leu	Gly	Phe	Gly	Ala
290							295				300				

Tyr Met Ser Lys Ala His Gly Ile Asp Pro Asn Ile Arg Thr Gly Val  
 305                   310                   315                   320  
 Arg Thr Ile Thr Thr Gly Ser Pro Ile Thr Tyr Ser Thr Tyr Gly Lys  
 325                   330                   335  
 Phe Leu Ala Asp Gly Gly Cys Ser Gly Gly Ala Tyr Asp Ile Ile Ile  
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 Cys Asp Glu Cys His Ser Thr Asp Ala Thr Ser Ile Leu Gly Ile Gly  
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 Thr Val Leu Asp Gln Ala Glu Thr Ala Gly Ala Arg Leu Val Val Leu  
 370                   375                   380  
 Ala Thr Ala Thr Pro Pro Gly Ser Val Thr Val Pro His Pro Asn Ile  
 385                   390                   395                   400  
 Glu Glu Val Ala Leu Ser Thr Thr Gly Glu Ile Pro Phe Tyr Gly Lys  
 405                   410                   415  
 Ala Ile Pro Leu Glu Val Ile Lys Gly Gly Arg His Leu Ile Phe Cys  
 420                   425                   430  
 His Ser Lys Lys Cys Asp Glu Leu Ala Ala Lys Leu Val Ala Leu  
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 Gly Ile Asn Ala Val Ala Tyr Tyr Arg Gly Leu Asp Val Ser Val Ile  
 450                   455                   460  
 Pro Thr Ser Gly Asp Val Val Val Val Ala Thr Asp Ala Leu Met Thr  
 465                   470                   475                   480  
 Gly Tyr Thr Gly Asp Phe Asp Ser Val Ile Asp Cys Asn Thr Cys Val  
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 Thr Gln Thr Val Asp Phe Ser Leu Asp Pro Thr Phe Thr Ile Glu Thr  
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 Ile Thr Leu Pro Gln Asp Ala Val Ser Arg Thr Gln Arg Arg Gly Arg  
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 Thr Gly Arg Gly Lys Pro Gly Ile Tyr Arg Phe Val Ala Pro Gly Glu  
 530                   535                   540  
 Arg Pro Ser Gly Met Phe Asp Ser Ser Val Leu Cys Glu Cys Tyr Asp  
 545                   550                   555                   560  
 Ala Gly Cys Ala Trp Tyr Glu Leu Thr Pro Ala Glu Thr Thr Val Arg  
 565                   570                   575  
 Leu Arg Ala Tyr Met Asn Thr Pro Gly Leu Pro Val Cys Gln Asp His  
 580                   585                   590  
 Leu Glu Phe Trp Glu Gly Val Phe Thr Gly Leu Thr His Ile Asp Ala  
 595                   600                   605

His	Phe	Leu	Ser	Gln	Thr	Lys	Gln	Ser	Gly	Glu	Asn	Leu	Pro	Tyr	Leu
610						615					620				
Val	Ala	Tyr	Gln	Ala	Thr	Val	Cys	Ala	Arg	Ala	Gln	Ala	Pro	Pro	Pro
625						630			635				640		
Ser	Trp	Asp	Gln	Met	Trp	Lys	Cys	Leu	Ile	Arg	Leu	Lys	Pro	Thr	Leu
						645			650			655			
His	Gly	Pro	Thr	Pro	Leu	Leu	Tyr	Arg	Leu	Gly	Ala	Val	Gln	Asn	Glu
						660			665			670			
Ile	Thr	Leu	Thr	His	Pro	Val	Thr	Lys	Tyr	Ile	Met	Thr	Cys	Met	Ser
						675			680			685			
Ala	Asp	Leu	Glu	Val	Val	Thr	Ser	Ala	Cys	Ser	Gly	Lys	Pro	Ala	Ile
						690			695			700			
Ile	Pro	Asp	Arg	Glu	Val	Leu	Tyr	Arg	Glu	Phe	Asp	Glu	Met	Glu	Glu
						705			710			715			720
Cys	Ser	Gln	His	Leu	Pro	Tyr	Ile	Glu	Gln	Gly	Met	Met	Leu	Ala	Glu
						725			730			735			
Gln	Phe	Lys	Gln	Lys	Ala	Leu	Gly	Leu	Ser	Arg	Gly	Gly	Lys	Pro	Ala
						740			745			750			
Ile	Val	Pro	Asp	Lys	Glu	Val	Leu	Tyr	Gln	Gln	Tyr	Asp	Glu	Met	Glu
						755			760			765			
Glu	Cys	Ser	Gln	Ala	Ala	Pro	Tyr	Ile	Glu	Gln	Ala	Gln	Val	Ile	Ala
						770			775			780			
His	Gln	Phe	Lys	Glu	Lys	Val	Leu	Gly	Leu	Ile	Asp	Asn	Asp	Gln	Val
						785			790			795			800
Val	Val	Thr	Pro	Asp	Lys	Glu	Ile	Leu	Tyr	Glu	Ala	Phe	Asp	Glu	Met
						805			810			815			
Glu	Glu	Cys	Ala	Ser	Lys	Ala	Ala	Leu	Ile	Glu	Glu	Gly	Gln	Arg	Met
						820			825			830			
Ala	Glu	Met	Leu	Lys	Ser	Lys	Ile	Gln	Gly	Leu	Ile	Gly	Ile	Leu	Arg
						835			840			845			
Arg	His	Val	Gly	Pro	Gly	Glu	Gly	Ala	Val	Gln	Trp	Met	Asn	Arg	Leu
						850			855			860			
Ile	Ala	Phe	Ala	Ser	Arg	Gly	Asn	His	Val	Ser	Pro	Thr	His	Tyr	Val
						865			870			875			880
Pro	Ser	Arg	Ser	Arg	Arg	Phe	Ala	Gln	Ala	Leu	Pro	Val	Trp	Ala	Arg
						885			890			895			
Pro	Asp	Tyr	Asn	Pro	Pro	Leu	Val	Glu	Thr	Trp	Lys	Lys	Pro	Asp	Tyr
						900			905			910			

Glu Pro Pro Val Val His Gly Arg Ser Ser Arg Arg Phe Ala Gln Ala  
915 920 925

Leu Pro Val Trp Ala Arg Pro Asp Tyr Asn Pro Pro Leu Val Glu Thr  
930 935 940

Trp Lys Lys Pro Asp Tyr Glu Pro Pro Val Val His Gly Arg Lys Thr  
945 950 955 960

Lys Arg Asn Thr Asn Arg Arg Pro Gln Asp Val Lys Phe Pro Gly Gly  
965 970 975

Gly Gln Ile Val Gly Arg Arg Gly Pro Pro Ile Pro Lys Ala Arg Arg  
980 985 990

Pro Glu Gly Arg Thr Trp Ala Gln Pro Gly Tyr Pro Trp Pro Leu Tyr  
995 1000 1005

Gly Asn Lys Asp Arg Arg Ser Thr Gly Lys Ser Trp Gly Lys Pro Gly  
1010 1015 1020

Tyr Pro Trp Pro Arg Lys Thr Lys Arg Asn Thr Asn Arg Arg Pro Gln  
1025 1030 1035 1040

Asp Val Lys Phe Pro Gly Gly Gln Ile Val Gly Arg Arg Gly Pro  
1045 1050 1055

Pro Ile Pro Lys Ala Arg Arg Pro Glu Gly Arg Thr Trp Ala Gln Pro  
1060 1065 1070

Gly Tyr Pro Trp Pro Leu Tyr Gly Asn Lys Asp Arg Arg Ser Thr Gly  
1075 1080 1085

Lys Ser Trp Gly Lys Pro Gly Tyr Pro Trp Pro  
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Gly Ser Ala Ala Arg Thr Thr Ser Gly Phe Val Ser Leu Phe Ala Pro  
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Gly Ala Lys Gln Asn  
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Lys Lys Gly Ser Val Val Ile Val Gly Arg Ile Val Leu Ser Gly Lys  
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Pro Ala Ile Ile Pro Lys Lys  
20